OCCURRENCE OF FUSIFORM RUST ON SLASH AND LOBLOLLY PINE ALONG THE APALACHICOLA RIVER ON THE APALACHICOLA NATIONAL FOREST, 1984

Robert L. Anderson
John L. Knighten
Thomas R. Gentry

INTRODUCTION

Fusiform rust, caused by Cronartium quercuum (Berk) Miyabe ex Shirai f. sp. fusiforme, is a native disease in the southeastern United States that was not considered to be a problem prior to 1930. Although, shortly thereafter, fusiform rust took on increased significance due to the intensification of timber cultural practices and the increased occurrence of the alternate host (oak). It is now considered to be the most important disease of pines in the southern United States. Today, 13.8 million acres are estimated to have 10 percent of the trees infected with main stem or branch galls, and about 2.5 million acres of the slash and loblolly pine resources are estimated to have over 50 percent of the trees infected. If the rust hazard for an area is known, rust control strategies can be integrated into the forest management system.

In 1983, Forest Pest Management was asked to evaluate the incidence and distribution of fusiform rust along an area adjacent to the Apalachicola River on the Apalachicola National Forest. This evaluation of fusiform rust on loblolly and slash pine was made in response to that request.

METHODS

Seven slash and nine loblolly stands were sampled throughout the survey area (Figure 1). All stands of the same species were at least one mile apart and were between 4-14 years old. Three 100-tree rows, or transects in plantations and in natural stands, were sampled (2). For each stand, the data collected included type of stand and age of stand (by boring three dominant trees). Each tree was examined and given a condition code: 1) healthy, not infected by fusiform rust, 2) fusiform canker on the main stem or on a branch within 12 inches of the main stem, 3) dead from fusiform rust, or 4) dead from other.

RESULTS AND DISCUSSION

Fusiform rust was found throughout the survey area (Figure 1). The age, percent healthy, galls on or within 12 inches of the main stem, killed by rust, dead from other causes, and stand type are summarized in Table 1. In all but one of the stands, the loblolly was found along the river and the slash pine away from the river (Figure 1). No natural slash pine stands were found, and only two of the loblolly were natural stands. The lowest amount of infection

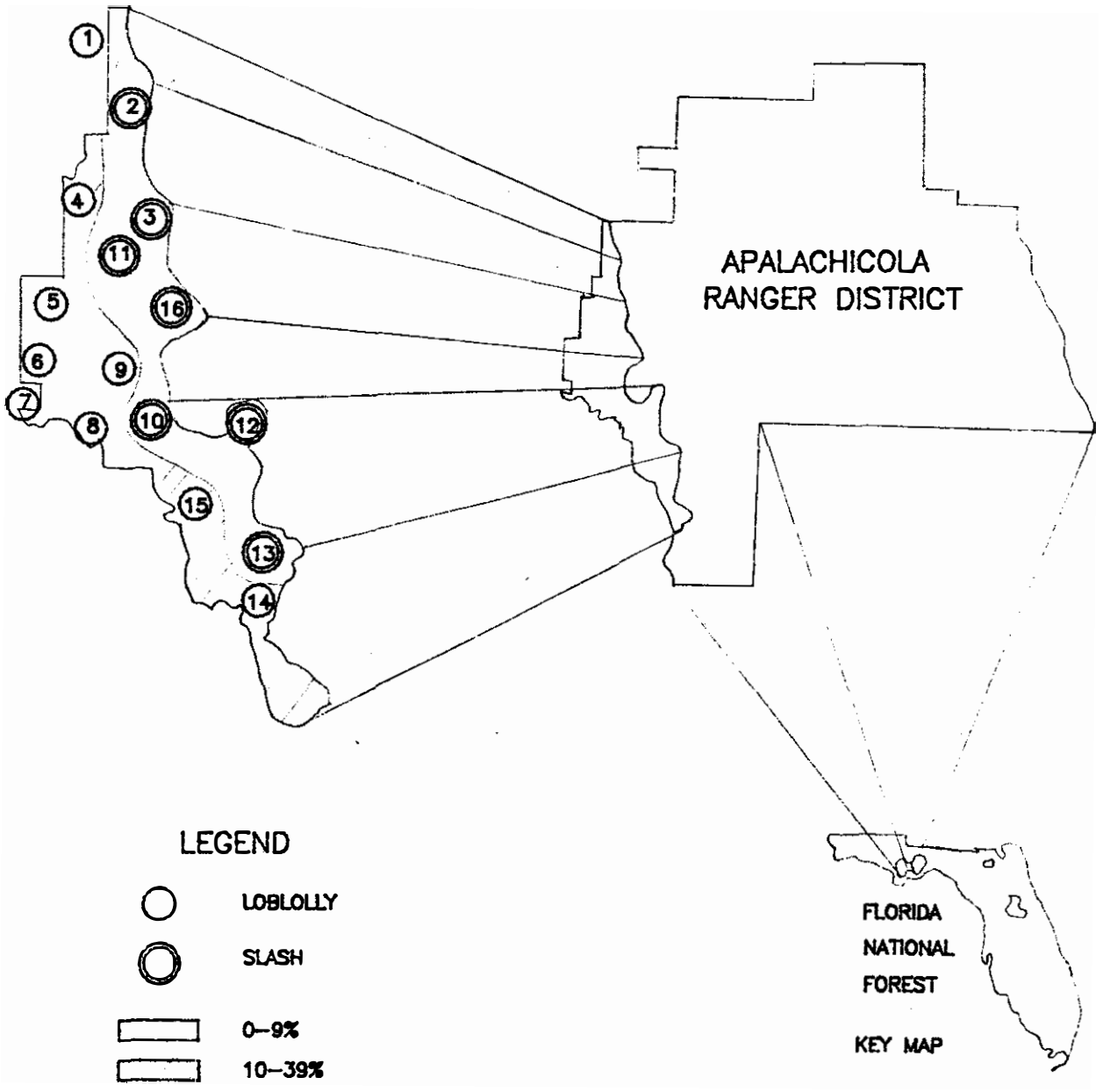

Figure 1.--Distribution of each species and stand surveyed. Fusiform rust hazard zones established in 1984. Circled numbers are the plots surveyed in 1984.

Table 1.--Summarized data on specific area of the Apalachicola National Forest.

Stand No.	Species	Age	% Healthy	% Galled	% Rust Killed	% Dead Other	Type of Stand
1	Loblolly	13	65.3	22.7	1.7	0	Plantation
2	Slash	12	90.5	5.4	1.0	0	Plantation
3	Slash	12	88.3	6.7	0.3	0	Plantation
4	Loblolly	9.6	76.3	16.7	0.3	0.3	Natural
5	Loblolly	5.9	79.7	20.0	0	0	Seeded
6	Loblolly	7.5	72.3	21.3	1.3	2.0	Seeded
7	Loblolly	7.2	63.6	27.3	3.6	1.4	Plantation & Seeded
8	Loblolly	8.4	55.3	35.0	1.3	2.0	Seeded
9	Loblolly	4.1	78.2	23.2	1.0	0	Plantation
10	Slash	16	90.0	5.0	0.7	4.3	Plantation
11	Slash	11	87.0	9.7	1.3	0	Plantation
12	Slash	8	97.0	2.3	0	0	Plantation
13	Slash	8.3	91.7	5.7	1.3	0.3	Plantation
14	Loblolly	8.2	82.7	13.0	0	0	Natural
15	Loblolly	5	68.7	29.7	1.0	0	Plantation
16	Slash	12	95.3	3.7	0	0	Plantation
Total							
	Loblolly		71.3	23.2	1.1	.6	All
	Slash		91.4	5.5	.7	.7	All

was 4 percent in a 12 year old slash pine stand. The highest was 37 percent in an 8 year old loblolly stand. An average of 16 percent of the trees in each plot have cankers on or within 12 inches of the main stem.

Overall, the loblolly had more rust (23.2 percent) as compared to the 5.5 percent average for slash pine. This difference in rust is probably caused by geographic location and not species. The loblolly was found in the low, wet areas where oak was common. The slash pine was found on drier sites with less oak. Stand number 7 had a mix of loblolly and slash, and was found along the river (Table 2). This stand showed that if slash pine was grown in the loblolly area, the amount of rust was the same for both species--27 percent for slash and 27 percent for loblolly. This is only one stand, but it gives an indication of what could happen if slash was planted along the river.

It may be noted that most of the slash pine stands in the survey area had pitch canker. Although no data were collected, it was estimated that some stands had approximately 25 percent of the stems infected. Since pitch canker has been documented as being more of a problem on wet sites, this problem may intensify.

MANAGEMENT CONSIDERATIONS

From a pathological viewpoint, the best approach for the area would be to manage loblolly along the river using a shelterwood regeneration for natural stands or moderately fusiform rust resistant trees for the plantations. If slash is introduced to this area, it will probably have as much or more rust as the loblolly and could have a major pitch canker problem. If slash is planted along the river, then highly rust resistant seedlings should be used to compensate for the potential loss to pitch canker.

Table 2.--Comparison of % infection between slash and loblolly trees in stand 7.

Species	% Healthy	% Galled	% Rust Killed	% Dead Other	Total No. Trees Examined
Slash	67.5	27.5	2.5	0	80
Loblolly	63.6	27.3	3.6	1.4	220

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Forest Pest Management
Asheville Field Office

Report #84-1-8
April 1984

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Prepared by: Robert Anderson
Supervisory Plant Pathologist

John L. Knighten
Biological Laboratory Technician

Thomas R. Gentry
Biological Laboratory Technician

Approved by: Harold W. Flake
for Harvey V. Yoko
Staff Director
Forest Pest Management